JPRS 75049

1 February 1980

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 28

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available from Bell & Howell, Old Mansfield Road, Wooster, Ohio 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. JPRS 75049	2.	3. Recipient's Accession No

4. Title and Subtitle
WORLDWIDE REPORT: NUCLEAR DEVELOPMENT AND PROLIFERATION, No. 28

5. Report Date
1 February 1980

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Joint Publications Research Service
1000 North Glebe Road
Arlington, Virginia 22201

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
As above

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This serial report contains worldwide press and radio coverage of nuclear research programs; technical indicators of nuclear capabilities; production capability; construction and purchase of nuclear facilities; status of uranium and thorium supplies; level of technology in high explosives and advanced munitions; government and nongovernment attitudes on nuclear-related topics; international agreements for nuclear cooperation; transfer of technology; personalities, organizations, equipment and facilities.

17. Document Analysis a. Descriptors
WORLDWIDE
Nuclear Proliferation
Nuclear Development
Uranium
Thorium
Technology

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group 18

18. Availability Statement
Unlimited Availability
Sold by NTIS
Springfield, Virginia 22161

19. Security Class (This Report)
UNCLASSIFIED

20. Security Class (This Page)
UNCLASSIFIED

21. No. of Pages
52

22. Price

(See ANSI-Z39.18) See Instructions on Reverse OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

JPRS 75049

1 February 1980

WORLDWIDE REPORT

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 28

CONTENTS PAGE

WORLDWIDE AFFAIRS

Kuwaiti Paper Says 'Islamic Nuclear Bomb' Nearing Completion
(AL-SIYASAH, 27 Dec 79)........................ 1

Japanese Expert Finds Radioactive Element at Three-Mile Island
(KYODO, 23 Dec 79)........................ 2

Austrian Authorities To Consider Threat by Czechoslovak Nuclear Reactors
(Freda Meissner-Blau; PROFIL, 17 Dec 79)........................ 3

Honduran Official Confirms Existence of Small Amounts of Uranium
(Armando Cerrato; ACAN, 5 Jan 80)........................ 6

Relationships Abroad Shown for Namibia's Roessing Mine
(THE STAR, 31 Dec 79)........................ 8

United Kingdom Announces Decision on Nuclear Reactors
(Peter Pryke; THE DAILY TELEGRAPH, 19 Dec 79)........................ 9

Briefs
Uranium for Taropur Plant 10
U.S.-India Nuclear Fuel Talks 10
Pakistani Expert Studying in USSR 10
Possible Brazilian-Iraqi Cooperation 11

CONTENTS (Continued) Page

ASIA

INTER-ASIAN AFFAIRS

Taiwan Power Company Official: ROC Uranium Supply Assured Until 1991
(Taipei International Service, 24 Dec 79)............... 12

INDIA

Briefs
Defense, Nuclear Plans 13

JAPAN

Government Publishes White Paper on Atomic Energy Development
(KYODO, various dates).................................. 14

Paper Presented to Cabinet
First Enriched Uranium
Second Reprocessing Plant

Briefs
Fast Breeder Reactor 17

PAKISTAN

Justification, Rationale on Government's Nuclear Power Program
(Munir Ahmad Khan; KHYBER MAIL, 7 Jan 80).............. 18

EAST EUROPE

INTERNATIONAL AFFAIRS

Briefs
CEMA Nuclear Meeting in Moscow 23

HUNGARY

Kadar Meets With Local Officials on Paks Nuclear Plant
(MTI, 19 Dec 79).. 24

LATIN AMERICA

ARGENTINA

Castro Madero Cites CNEA 1979 Accomplishments
(LA PRENSA, 7 Jan 80)................................... 25

CONTENTS (Continued)

Page

Castro Madero Reaffirms Nation Will Not Become Nuclear Dump (LA NACION, 2 Jan 80) 32

Briefs
Nuclear Accelerator 34

BRAZIL

Text of Nuclear Accord With Iraq Outlined (JORNAL DO BRASIL, 8 Jan 80) 35

Fund Shortages Limit NUCLEBRAS 1979 Uranium Prospecting (JORNAL DO BRASIL, 28 Dec 79) 37

Status of Uranium Enrichment Pilot Plant, Others Discussed (O GLOBO, 8 Jan 80) 39

FURNAS Renegotiates Loans for Angra Powerplant Construction (O GLOBO, 29 Dec 79) 41

NEAR EAST AND NORTH AFRICA

ISRAEL

Briefs
Uranium Production 43

USSR

Academy of Sciences President, Officials on Nuclear Energy (TASS, 18 Dec 79) 44

'Fuss' Over Nuclear Power Station Safety Dismissed (Radio Moscow; 16 Dec 79) 45

Nuclear Energy Experts Praise Safety Measures, Lack of Accidents (Moscow World Service, 20 Dec 79) 47

Briefs
Prototype Reactor 48

WEST EUROPE

SPAIN

Briefs
Power Station Construction Halted 49

KUWAITI PAPER SAYS 'ISLAMIC NUCLEAR BOMB' NEARING COMPLETION

LD281555 Kuwait AL-SIYASAH in Arabic 27 Dec 79 pp 1, 16 LD

[Diplomatic editor report: "The Islamic Nuclear Bomb; Pakistan Briefs Saudi Arabia and Iran on It; Pakistani-Libyan Nuclear Bomb Might Become Ready Before Middle of Next Year"]

[Text] Reports circulating in diplomatic circles say that part of the aim Pakistani President Gen Ziaul Haq's visit to the Saudi Arabian Kingdom which ended yesterday and of Pakistani Minister of State for Foreign Affairs Agha Shahi's sudden visit to Tehran yesterday was to acquaint the two Islamic states (Saudi Arabia and Iran) with what has been described as an advanced stage in the completion of "the Islamic nuclear bomb." The reports circulated--which are difficult to confirm--add that Pakistan-Libyan cooperation in the manufacture of a nuclear bomb has, during recent weeks passed a crucial stage, making it possible to expect the bomb to become ready before the middle of the coming year, thus prompting Pakistan to present the details of the matter to the Islamic countries.

Although many observer circles have not been taking the question of a Pakistani Islamic nuclear bomb seriously and have been looking at it merely as some sort of a political uproar from which several parties would benefit to various degrees, other sources now talk seriously about this bomb as being a pursuit [matlaban] which Libya paid large sums to bring about and which Pakistan has carried through to an advanced stage.

Various earlier reports said Pakistan had obtained the uranium necessary for the manufacture of the bomb from one of two sources: either through a British-Dutch-German firm for which a Pakistani engineer was working, or through the smuggling of uranium-laden trucks from Niger to Libya and thence to Pakistan.

It is worth noting that the question of the Pakistani nuclear problem is not new, in that it was previously raised during the rule of late Prime Minister Zulfikar Bhutto. It was said at the time that this matter was the cause for U.S. insistence on toppling Bhutto. The subject was brought up once again in the past few months as an item of Libyan-Pakistani cooperation--in manufacturing this weapon which is intended to become an Islamic weapon likely to be of the advantage to the rest of the Islamic countries. It was probably in view of the latter possibility that recent reports have said the matter is now being put to the Saudi Arabian Kingdom and Iran as two Islamic states with whom Pakistan has a particular desire to cooperate.

CSO: 5100

JAPANESE EXPERT FINDS RADIOACTIVE ELEMENT AT THREE-MILE ISLAND

OW230453 Tokyo KYODO in English 0424 GMT 23 Dec 79 OW

[Text] Tokyo, Dec 23 KYODO--A Japanese expert who went to the U.S. to conduct a probe of last March's Three Mile Island nuclear accident has reported that radioactive element cesium 134 of high density was detected from mud collected from the Susquehanna River in Pennsylvania where the accident occurred.

Dr Nobuya Ogino, an assistant at the nuclear engineering room of Kyoto University's Faculty of Engineering, said Sunday this is a new fact not disclosed in data announced by the U.S. authorities on the test. Ogino visited the U.S. for some 15 days from October 25 to gather information on the accident.

On October 27, he went to the Three Mile Island, located on the Susquehanna River, by boat with local residents and collected mud from a point 15 meters from the site where the nuclear plant was located. After bringing back the mud samples to Japan, Ogino said he conducted an analysis at his university and the University of Tokyo with a germanium-rithium measuring instrument and detected cesium 134 of high intensity.

Ogino said no mention was made of such radioactive element in survey data released so far by the U.S. Nuclear Regulatory Commission (NRC).

Cesium 134 is an artificial radioactive element produced through nuclear reaction of cesium 134 which is created through the collapse of xenon 133 occurring in the fuel rods within a nuclear reactor. Ogino said analysis conducted at Kyoto University showed that there were 95 picocuries of the element per kilogram of the mud while the check at the University of Tokyo showed a figure of 105 picocuries.

According to the report of the NRC, announced earlier, some 1,000 cubic meters of liquid waste were released into the river but the radioacitivty level was below the permissible level. It said also that the radioactive elements were made up only of iodine 131 with a short half-life of eight days. No mention was made of cesium 134 which has a half-life of 2.1 years.

Ogino conducted a check of the mud samples at the request of local residents in Goldsboro, near the Three Mile Island plant, who expressed fears over environmental pollution through radioactivity. He plans to prepare a report in English on his findings and send them to the residents during this month.

CSO: 5100

AUSTRIAN AUTHORITIES TO CONSIDER THREAT BY CZECHOSLOVAK NUCLEAR REACTORS

Vienna PROFIL in German 17 Dec 79 pp 20-21

[Article by guest commentator Freda Meissner-Blau: "Threat From the East--The Austrian Authorities Would Be Well Advised To Draft an Evacuation Plan"]

[Text] It must be quite depressing to be a hard-line communist in Austria these days. Depressing and awkward, constantly to have to come up with explanations for every new election defeat, for the drying up of the party, and really repugnant to have to invent justifications for trials and horror sentences of critics in countries of the East, whose rigid system does not tolerate any deviation. And all this in light of a public trained to be anticommunist anyway, in light of media which love to jump at anything that is happening to those in the East in the way of stupidity and brutal derailments.

It is all the more amazing how mercifully silent our press, our radio and television are about a scandal in our neighboring country Czechoslovakia which is of direct concern to us at that.

The Charter 77 Document No 22 (obtainable in Britain through Palach Press) tells the history of the Czech nuclear reactor A1, Jaslovske Bohunice, north of Bratislava. The reactor was designed jointly by Russian and Czech specialists. The time for its construction--15 years--broke all negative speed records. And its power production functioned all the worse: when it finally started operations in 1973, it reached a performance of 100, of the planned 150, megawatts only for very short periods. During all of the 26 months in which it managed to operate without a major breakdown, it frequently was inoperative.

The Czechoslovak safety provisions are among the strictest in the world and, in turn, according to the Charter reporters, are also circumvented most frequently. As in nuclear industry everywhere, these regulations state that workers working in the "hot" (radiation) area have to get away from it when they have received the annual maximum dose of radiation.

Then they are considered "roasted through." Owing to the frequent breakdowns, however, all qualified radiation workers very soon were in a "roasted through" state, and their places in the radiation area therefore had to be taken by unschooled workers from other departments. If anyone resisted this arrangement, he was punished with a wage reduction.

In the NEW STATESMAN AND NATION Duncan Campbell describes the two serious accidents which occurred in the reactor in 1976 and 1977 and finally, after 5 years of muddling through, apparently led to its complete shutdown. The first accident, in January 1976, occurred during the exchange of the fuel elements. During it new uranium fuel rods are pushed into the core of the reactor in long covers. Always a difficult operation, it is particularly delicate if, as at Bohunice, it has to be executed while the reactor is working--in other words, while the chain reaction is going on.

The Bohunice reactor is cooled by carbon dioxide under pressure of 60 atmospheres. To control the pressure, safety valves are inserted into the covers of the fuel rods. On 5 January 1976 one of these valves got stopped up. The high gas pressure flung the new fuel element from the reactor, and hot radioactive gas poured under great pressure into the surrounding work areas. An alarm was sounded immediately, but two workers suffocated nevertheless: the emergency exit had been barred "to prevent the frequent thefts." The four emergency containers whose purpose it was to receive possibly escaping gas until its radioactivity had lessened to the point of it being possible to release it into the atmosphere were too small in this case, and the radioactive gas poured immediately into the open. No warning was issued to the population, and the reactor personnel were not notified how much radioactivity it had received.

The reactor was repaired, and it functioned until 24 February 1977. Then an even more serious accident occurred, which presumably put the reactor out of action for good. Again there was negligence in loading with new fuel rods. The reactor was in operation. One of the fuel rods overheated, its cover became damaged, and the gas escaping from it combined with the heavy water which in this type of reactor is used as a moderator (for stopping and taking on supernumerary neutrons). The whole cooling gas cycle was contaminated by a number of radioactive materials, including the highly toxic tritium. The hot gas damaged the secondary cooling system, the heat exchanger, [in] which the carbon dioxide supplies its heat to the steam for operating the turbines. The seal of one steam generator burst, and the radioactive materials reached the turbines via the water and steam. At this point, the report says, a number of tears and cracks were already occurring in the cooling system and in the reactor core, contaminated steam escaped into the atmosphere, and radioactive tritium penetrated into the surrounding work areas. When an attempt was made to clean the radioactive masses of water, part of it by mistake was allowed to go into the local network of canals and, among other things, reached a river near Zlovec. The banks of the river were barred for a time.

Negligence and mistakes, pressure of performance and fatigue (there were 16-hour shifts at the reactor), the cynicism and dead silence of responsible offices but above all the lack of a critical opposition and of a free press promote the rise of such dangers.

In the meantime in Bohunice two new Soviet Voronezh reactors are on the verge of being completed, and another installation being built in Dukovany is to be ready for operation in 3.5 years. Another reactor is planned on the Thaya about 35 kilometers from the Austrian border but apparently will be shifted from the present five-year plan to the next. If it actually should be built, the Austrian authorities would be well advised to draft an evacuation plan for the border population affected on the Austrian side.

The enthusiasm about nuclear energy, however, lately has also sounded somewhat subdued on the other side of the Iron Curtain, with programs slowing down in various places and prominent Soviet scientists daring to voice their first criticism. Of course VOLKSSTIMME (on 18 October 1979) maintained that no radioactivity had been released in the accidents at Bohunice, but we believe the Charter 77 reports to be more reliable. On the other hand, VOLKSSTIMME may be quite right when it asserts that these accidents happened "merely" because of human inadequacies, for this is true of 90 percent of all accidents in all fields. What this actually means is that people liable to err need a technology which can forgive the human mistakes, rather than one which as a result of the slightest error becomes a serious threat.

8790
CSO: 5100

HONDURAN OFFICIAL CONFIRMS EXISTENCE OF SMALL AMOUNTS OF URANIUM

PA062215 Panama City ACAN in Spanish 2232 GMT 5 Jan 80 PA

[Article by Armando Cerrato]

[Text] Tegucigalpa, 5 Jan (ACAN-EFE)--Honduran National Resources Secretary Rafael Leonardo Callejas admitted here today that he has known about the existence of uranium in El Mochito, in the western Department of Santa Barbara.

The official admission came following charges by Manuel Guerrero, former president of El Mochito Mine Labor Union, that the government is trying to hide the exploitation of the radioactive material.

Guerrero said he had evidence of the existence of uranium and of its exploitation and export to the United States by Rosario Resources Corporation, a U.S. transnational. He noted that this was being done behind the backs of the Honduran Government and people.

The residents of El Mochito have insisted for several years that the company has taken sophisticated material and equipment there, that many miners have been seen with strange burns and that others have died from diseases never known before in the area.

There were also reports of strange lights coming from deep underground and of the shipment of minerals and garbage which the company sometimes made with the protection of armed guards.

However, the Honduran authorities had always denied the existence of radioactive material in the country and had indicated that the reports of Honduran geologists and mine and chemical experts coincided with those of the U.S. company.

Callejas said today that "it is true that there is uranium in El Mochito but not in commercial quantities profitable for anyone to exploit."

He indicated he obtained the first reports about the uranium from a U.S. laboratory because Honduran technicians and chemists do not have the necessary equipment to detect it here.

According to the U.S. analysis, a sample of the mineral extracted from El Mochito contained .001 percent of uranium oxide per ton.

"That is a very small amount, not sufficient for export. The uranium is found in the form of traces," Callejas said. The official's statement was confirmed by one of his subordinates who said he was a chemist.

Former union leader Guerrero also accused the military government junta of being weak and of not having sufficient courage to stop the maneuvers of the Rosario company, and much less of protesting the illicit exploitation of uranium.

Regarding this charge, Callejas said "the government is not weak and despite the reports it already has and which it believes in, the government has sent a technical mission to El Mochito to undertake investigations on the subject." Callejas said the government will verify if the uranium is exportable and if the company has been exporting it illegally. He criticized the union leaders for not following normal channels to make their charges and for turning to the press before taking the matter up with government officials.

CSO: 5100

RELATIONSHIPS ABROAD SHOWN FOR NAMIBIA'S ROESSING MINE

Johannesburg THE STAR in English 31 Dec 79 p 3

[Text]

LONDON — Uranium from the Rossing Mine in SWA/Namibia is being processed into usable reactor-grade uranium by the Soviet Union — and the South African Cabinet knows and approves of this according to a report in the London Sunday Times.

The only state to admit publicly it receives shipments of uranium from Rossing is Britain, which relies on the uranium to meet 42 percent of her domestic nuclear power programme needs.

It is also known that France has shares in Rossing and also receives and processes its uranium for its nuclear stations.

The mine belongs to Rio Tinto Zinc, a British Company.

The West German and Japanese Governments have repeatedly denied any links with Rossing.

But inquiries by the Sunday Times in South Africa, the United States, France, Holland and West Germany have uncovered some startling new facts, says the report:

● Iran has a 15 percent stake in Rossing and is a major buyer of its uranium. This deal was concluded by the Shah. The Ayatollah Khomeini's regime is now trying to break the contract.

● Despite a Government announcement that all connection with Rossing had been severed years ago, West Germany in fact remains a major investor in and a major buyer from Rossing.

● Despite equally vehement protestation to the contrary by the former Japanese Prime Minister, Japan also continues to receive Rossing uranium.

But it is the processing of the Rossing uranium which gives rise to the most surprises, says the report.

The uranium leaves Rossing as oxide but has to go through various stages including enrichment before it can be inserted into the nuclear reactors.

Iran has no enrichment plant and West Germany does not have an independent one. The only member of the nuclear club which has surplus enrichment capacity is the Soviet Union — a by-product of their ambitious military programme.

● In 1975-1976 the Soviet Union did a deal with the Shah. The Soviet state company Techsnabexport enriches the Rossing uranium on behalf of Iran.

● The Soviet Union is also enriching SWA/Namibian uranium on behalf of West Germany. The report estimates about half of West Germany's current needs are processed from the Rossing uranium by the Soviet Union.

● At an earlier stage in the processing the British company British Nuclear Fuels also handles SWA/Namibian uranium on behalf of Iran.

● The South African Cabinet is not directly party to any of these deals, says the report, but it knows of — and had to approve — all of them.

CSO: 5100

UNITED KINGDOM ANNOUNCES DECISION ON NUCLEAR REACTORS

LD191129 London THE DAILY TELEGRAPH in English 19 Dec 79 p 5 LD

[Article by Peter Pryke: "Pledge of 'Safety First' on New Nuclear Reactors"]

[Text] The government's decision to have an American pressurised water reactor for the next nuclear power station will only be put into effect if clearance on safety grounds is obtained, Mr Howell, energy secretary, said in the Commons yesterday. "Safety is paramount," he said. "We intend it should remain so." Statutory consent to build the station would be needed, and an inquiry would be held in due course.

The pressurised water reactor (PWR) is of a type similar to that involved in the Harrisburg disaster in Pennsylvania. But Mr Howell said that "what went wrong had most to do with the organisational procedures of the plant...and much less to do with the integrity of the system."

He denied a claim by Mr Benn, former energy secretary, that the government was going in for "a crash programme" of nuclear development with suspect American reactors. Mr Benn said that this, together with the problems of the storage of highly activated waste, would put the nuclear industry into "the heart of public controversy" after the great public confidence which had resulted from the patient way development had proceeded in the past.

Mr Howell replied that the programme's electricity generating capacity would be far short of the sort of level outlined in Mr Benn's own consultative green paper. It was a limited programme and rightly so, as this was a complex matter.

Mr Howell denied that the switch means that the government has abandoned the British advanced gas-cooled reactor which has been in use in this country for 22 years. "The whole aim of our programme must be to see if we can build PWR and get the satisfactory safety clearances." If so a decision could be taken on which reactor system should be adopted for the necessary and limited programme of 10 new nuclear power stations for the 10 years from 1982.

Dr David Owen, opposition spokesman on energy, said that particularly following the Harrisburg incident, the opposition had reservations over the wisdom of the change to the American PWR. Mr Howell said those who had doubts should recall that there were now operating in the world no less than 153 light water reactors and a further 180 were being built. "It is a mature system with up to 400 years operating behind it already, and to cut ourselves off from the opportunity of operating PWR would be most unwise indeed."

CSO: 5100

BRIEFS

URANIUM FOR TAROPUR PLANT--New Delhi, 4 Jan (AFP)--India is still awaiting official information from the United States on an early shipment of enriched uranium for use at the Tarapur atomic power plant near Bombay, official sources said today. They were commenting on Washington reports that a broad consensus had been arrived at a meeting of the U.S. National Security Council to go ahead with the controversial further shipment of uranium to India under the existing contract. There are two applications now pending before the Nuclear Regulatory Commission of the U.S. for 39.6 tonnes of enriched uranium, it was pointed out here. [Text] [OW041834 Hong Kong AFP in English 1832 GMT 4 Jan 80 OW]--No official information has been received in New Delhi so far about the report in a section of the press that the United States is supplying enriched uranium for the Tarapur power plant shortly. Sources in New Delhi, however, do not see any link between these supplies and other developments in this part of the world. India would only be glad if Washington should fulfill its contractual obligations on the supply of fuel for Tarapur if the press report is correct. [Text] [BK050422 Delhi Domestic Service in English 0245 GMT 5 Jan 80 BK]

U.S.-INDIA NUCLEAR FUEL TALKS--The United States plans to open discussions with India about the supply of nuclear fuel soon. A spokesman of the State Department quoting President Carter said in Washington that any decision to release the fuel would be made on the basis of U.S. policy toward India. He said the discussions are likely to begin when U.S. Ambassador Robert Gohean returns to New Delhi from Washington. [Text] [BK091051 Delhi General Overseas Service in English 1000 GMT 9 Jan 80 BK]

PAKISTANI EXPERT STUDYING IN USSR--Pakistani (?nuclear) expert (Ehsan Fatah) has started research work at the nuclear research institute at Duba near Moscow. The institute awarded a scholarship to (Ehsan Fatah) on the recommendation of the noted Pakistani scientist and Nobel laureate Abdus Salam. (Ehsan Fatah) will conduct research jointly with Soviet scientists on a (?nuclear generator) at the Dubna institute. [Text] [BK180831 Moscow in Urdu to Pakistan 1500 GMT 13 Dec 79 BK]

POSSIBLE BRAZILIAN-IRAQI COOPERATION--Belo Horizonte, Brazil, 15 Dec (AFP)--Paulo Nogueira Baptista, president of the Brazilian Nuclear Corporation (NUCLEBRAS), said here today that there is a possibility Brazil and Iraq will sign a nuclear cooperation agreement. Nogueira Baptista who is in this city, capital of Minas Geirais State in the southeast of the country, indicated that an Iraqi mission which visited Brazil last October stated their government's desire to establish broad cooperation in the nuclear field between the two countries. The NUCLEBRAS president indicated that the cooperation between Brazil and Iraq in the nuclear field includes the transfer of technology in the process of enriched uranium and the supply of this mineral to Iraq. [Text] [PY172033 Paris AFP in Spanish 1510 GMT 15 Dec 79 PY]

CSO: 5100

TAIWAN POWER COMPANY OFFICIAL: ROC URANIUM SUPPLY ASSURED UNTIL 1991

OW241643 Taipei International Service in English 0100 GMT 24 Dec 79 OW

[Text] In Taipei, an official of the state-run Taiwan Power Company [Taipower] said Sunday, the Republic of China has secured sufficient supply of fuel uranium for its nuclear power plants until 1991. He said the United States is the major supplier of the fuel uranium. He said the company may also approach other countries for the supply of fuel uranium. The first nuclear power plant of the company has already started operations. The second and third nuclear power plants will become operational respectively in 1981 and 1985. The state-run power company has signed contracts with foreign suppliers for fuel uranium to feed the nuclear power plants up to 1986. It has also contacted foreign suppliers for more uranium for needs between 1987 and 1991, he said.

Meanwhile, it is reported the company will import 8 million metric tons of coal from the United States in the next 5 years. The coal will be purchased from coal mines in Tennessee, Kentucky and Kansas. The coal will be used to fire Taipower's thermal power plants. He said some of the oil-fired plants will be converted into coal-fueled ones. A Taipower official has just returned to Taipei from a visit to the three U.S. states for coal purchases. He said coal miners there were glad to sell coal to Taiwan for power generation. In 1980 the company will import 3 million metric tons of coal for power generation. The coal will come from the United States, Australia and South Africa.

CSO: 5100

BRIEFS

DEFENSE, NUCLEAR PLANS--The union defense minister, Mr C. Subramaniam has said that the country is now going in for an ambitious research and development program to attain self-sufficiency in defense preparedness in the 90's. Speaking to newsmen in Madras, he said India should have to reconsider its nuclear policy if Pakistan goes nuclear. The Pakistan president General Ziaul Haq, is reported to have said recently that they would get their nuclear results within a year, the defense minister added. [Text] [BK271110 Delhi Domestic Service in English 0245 GMT 27 Dec 79 BK]

CSO: 5100

GOVERNMENT PUBLISHES WHITE PAPER ON ATOMIC ENERGY DEVELOPMENT

Paper Presented to Cabinet

OW250240 Tokyo KYODO in English 0131 GMT 25 Dec 79 OW

[Text] Tokyo Dec 25 KYODO--Japan faces the ever increasing need to develop its own atomic energy industry, although due caution must be taken about safety measures, a government white paper said Tuesday.

The white paper on atomic power for 1979 was presented to the day's Cabinet session by Yuui Osada, director general of the Science and Technology Agency and chairman of the Atomic Energy Commission. The safety of nuclear power generating plants became the center of controversy this year following the Three Mile Island accident in March in the United States. All major industrial countries of the world share the view, however, that development of atomic energy is still an absolute necessity, the white paper said.

In Japan, which accounts for about 10 percent of global energy consumption, atomic energy utilization is particularly important in view of the oil supply difficulty caused mainly by the Iranian crisis, the white paper said. It also said that atomic power development in Japan would have to be carried out more by private industries than under government-oriented projects. Japan's energy industry will have to become one of its export industries in the future, it said.

As the matter of atomic safety was taken up by the Japan Atomic Power Safety Commission set up in October 1978, the white paper issued by the Science and Technology Agency did not touch on details of the problems stemming from the Three Mile Island accident. It simply pointed out that more efforts were called for in the United States to improve atomic power facilities and similar efforts were also required in this country.

On the proposed introduction in Japan of the Canadian-developed CANDU nuclear furnace, which caused disputes between the Ministry of International Trade and Industry and Atomic Energy Commission, the white paper said, "It is difficult to find positive reasons to support its introduction at present."

The white paper said that Japan now has 21 atomic power plants with a total generating capacity of 14,952,000 kilowatts. Under present plans, Japan's power-generating capacity through use of atomic energy will be increased to 30 million kilowatts in 1985, 53 million kilowatts in 1990 and 78 million kilowatts in 1995, it said.

To achieve this goal, the White Paper said, the major difficulty lies in acquiring of necessary plots for construction of new power plants. Although the Japanese people in general still have a feeling of uneasiness about the safety of atomic power plants, they well understand the necessity of promoting atomic energy research and development, it added.

First Enriched Uranium

OW261155 Tokyo KYODO in English 1142 GMT 26 Dec 79 OW

[Text] Tokyo, Dec 26 KYODO--The Power Reactor and Nuclear Fuel Development Corporation announced Wednesday that it has successfully produced Japan's first enriched uranium usable as fuel for light water reactors.

The corporation said that its centrifugal uranium enrichment pilot plant in Ningyotoge in Okiyama Prefecture turned out in the middle of this month a total of about 300 kilograms of enriched Uranium with some 3.2 percent concentration. The amount is enough to operate an atomic-powered electricity generating plant with a capacity of 1 million kilowatts, the corporation said.

The pilot plant has been under construction since August 1977. The enriched uranium was collected from about 1,000 "OP-1A" centrifugal separators which have been operated at the plant since September 12. The corporation plans to install by next Autumn 3,000 "OP-1B" centrifugal separators whose separation capacity is about 1.2 times higher than the "OP-1A." A further 3,000 OP-2 separators which have twice the capacity of the OP-1A will be installed by the autumn of 1981, the corporation said.

Second Reprocessing Plant

OW301137 Tokyo KYODO in English 0808 GMT 30 Dec 79 OW

[Text] Tokyo, Dec 30 KYODO--The Japanese power industry, with government financial backing, will launch full-fledged preparations in the new year to build the country's second nuclear fuel reprocessing plant. In the fiscal 1980 state budget apporved by the Cabinet Saturday, the Ministry of International Trade and Industry was empowered to disburse yen 2.111 million to finance initial technology tests on some of the equipment to be installed at the plant. Additionally, the official Development Bank of Japan will provide an unspecified amount of low-interest loans.

MITI officials said the factory, annually capable of reprocessing 1,200 tons of used uranium fuel, should be completed in 1990 at a site yet to be chosen. Total costs are estimated at yen 690 billion ($2.86 billion), they said. Present plans call for inaugurating a new private corporation called "Japan Nuclear Fuel Service" in March to oversee construction of the factory.

Investing in the yen 10 billion ($41.7 million) corporation will be more than 90 businesses, including the country's nine power companies, steelmakers, shipbuilders, electrical equipment manufacturers, chemical producers, trading houses and banks. One of its initial tasks will be to select a plant site from among about 60 candidate sites picked so far, MITI sources said.

But whether Japan can go ahead with the project will depend on the outcome of a study now underway for the International Nuclear Fuel Cycle Evaluation (INCEF). MITI sources said the 40-nation INCEF, to which Japan is a party, is expected to give the go-ahead to the project in its final report scheduled for February. The sources said another hurdle to be cleared is where to locate the plant and how to enlist support of residents.

CSO: 5100

BRIEFS

FAST BREEDER REACTOR--Osaka, 8 Jan--Yoshitake Sasaki, minister of international trade and industry, said Tuesday the government is prepared to spend 1 trillion yen (about $4.3 billion) to develop a fast breeder reactor within 10 years. The fast breeder reactor is generally believed to be the main type of reactor for the future. Sasaki announced the government policy at a meeting here with businessmen from western Japan. [Text] [Tokyo KYODO in English 1236 GMT 8 Jan 80 OW]

CSO: 5100

JUSTIFICATION, RATIONALE ON GOVERNMENT'S NUCLEAR POWER PROGRAM

Peshawar KHYBER MAIL in English 7 Jan 80 p 4

[Article by Munir Ahmad Khan, chairman, Pakistan Atomic Energy Commission]

[Text]

It is indeed a very great honour for me to have been invited to this Congress which, as the Secretary has pointed out, is the oldest and most highly respected engineering society in the country. You know better than any one else what is the justification and rationale for Pakistan's nuclear power programme and why Pakistan is pursuing it despite opposition from several quarters.

At the very outset, I would like to emphasize that Pakistan's nuclear power programme has been stepped up and is being vigorously pursued not because of prestige or domestic political reasons. The programme has been devised only and largely by keeping the overall national requirement of developments in view. It is not a short-term programme but represents a long-term commitment to meet our energy and fuel needs for the next few decades.

IMPORTANCE OF ENERGY

For the development of a country it is essential to provide inputs of energy, capital, management, know-how and skills.

It is now an established fact that the per capita consumption of electricity in any country is one of the reliable indices of growth and development in the country. To illustrate this one may make a comparison between the advanced countries and the developing nations with regard to energy consumption.

In USA, an average citizen consumes about 10,000 units of electricity per year. In the other advanced countries of West Europe, this consumption is between 6000 to 9000 Kwh per capita. The world average is about 1600 units per capita per year and even in the poorer nations of Asia the average is more than 300 units per year. This is in sharp contrast to Pakistan where the average consumption of electricity has risen only recently to barely 160 units per person from a mere 10 Kwh per capita per year at the time of Independence in 1947.

Not only that, even our known fosil fuel reserves are also extremely limited and inadequate to meet our demands. Despite latest discoveries of oil and gas at Dhodak and Pir Koh in Baluchistan our total known fossil fuel reserves of coal, oil and gas are so limited that they correspond to about 1/40th of the world average per head and are equivalent to only 15 tons of coal per head. How meagre this amount is can be judged from the fact that it corresponds to average consumption per capita in the United States in just over one year. This means that our nation has a total reserve per citizen which would suffice for only one year for an average American.

Our planners have estimated that the per capita consumption of energy in Pakistan will increase fourfold by the end of this century. Over the same period our electricity consumption would grow even faster, from the present 160 Kwh per capita to 700 Kwh per capita. It may be noted that during this period the average world consumption will increase to well over 3500 Kwh per capita.

How to meet our growing demands? Of course, we have to exploit to the maximum our hydro potential, coal, oil and gas and in fact whatever energy source we can harness expeditiously.

CONVENTIONAL ENERGY RESOURCES

Our conventional energy resources are, however, very limited. Hydro power is our major resource at the moment but it has constraints both due to the total amounts available and the rate and location at which it can be exploited. Most of the hydro resources are concentrated in the north and require high transmission costs to utilize the power generated at the load centres. As the most favourable sites have been exploited the cost of constructing dams at new locations, most of which are in seismic region, is becoming very high. Nevertheless from technological and economic points of view we can exploit only 40 per cent of 20,000 by the end of this century. Thus hydro can provide about 30 per cent of the installed capacity requirement.

COAL GAS, OIL

The coal in Pakistan is not only limited in quantity but most of it is lignite and thus poor in quality and difficult to use for power production. Our total coal deposits (proven and probable) amount to 473 million tons but when reduced to good quality coal correspond to only 173 million tons. This may be compared with 81 billion tons of coal reserves in India.

Contrary to the general belief Gas reserves in Pakistan are not very large and it will continue to be used for other valuable purposes. Gas is a very important raw material and we need to utilize it in the manufacture of fertilizers, petro-chemicals and domestic use and cannot afford to burn it merely for power production in fact, the optimal economic use of gas particularly when it is not available in large quantities does not permit its use for power production. Our reserves of 26.4 million million cubic feet correspond to 724 million tons of coal and unless new discoveries are made our gas will be fully committed by 1988. Last year Pakistan spent over 500 million dollars on the import of oil to meet its domestic requirements of industry and transportation. This year the oil import bill would be $ 935 million which represents 43 per cent of our foreign exchange earnings. Even after the recent discoveries of oil at Dhodak, we will continue to import over 85 per cent of our total needs. Oil import bill accounts for more than one third of our foreign exchange earning and keeping in view the trend of increase in oil prices and the growing demand, this bill will go much higher. Obviously it will be an unbearable strain on our economy to further increase the cost of importation of oil by using it for power generation on a large scale. Besides, oil has several other important uses and it is not optimally economical to burn it for power production. That is why even those countries which have surplus oil reserves are turning to nuclear energy to meet their energy demands. The growing consumption of oil and its increasing prices demand that even if we succeed in striking indigenous reserves of oil we will have to depend upon other more economical sources of power generation.

In spite of these limitations of conventional resouces of energy our planners have earmarked a considerable portion of them for power generation. Our estimates show that even after allocating a significant portion of the available gas and coal for power production, our hydro and other conventional resources cannot give us more than 11,000 megawatt installed capacity by the end of this century as against our demand of 27,000 megawatt by that time.

Keeping in view this energy resource picture, Pakistan has no choice but to look forward to nuclear energy for meeting its power demands. For it offers the only economical and practical answer to our problem of energy shortage.

NUCLEAR POWER STATIONS

The Pakistan Atomic Energy Commission has prepared itself for the role to play in meeting energy requirements. A 137 MW nuclear power plant is already functioning at Karachi. The plant, run and maintained entirely by Pakistan engineers, has offered us most valuable experience. The Canadian embargo on the supply of nuclear fuel and spare parts in December 1976 started the beginning of a self reliant programme in Pakistan which will reduce our dependence upon others. The fact that the KANUPP has been run and maintained satisfactorily by our engineers since 1976 despite Canadian embargo is a testimony to our determination to be on or own.

Following KANUPP another nuclear power plant is planned to be set up at Chashma in Mianwali District in the Punjab. Necessary preliminaries for this 600-MW power plant have been completed and the actual construction will begin as soon as the difficult financial position becomes easy. This multimillion project has been approved by the Executive Committee of the National Economic Council. Following Chashnupp, the Commission plans to set up more nuclear power plants at a much faster rate.

REPROCESSING PLANT

Now I turn to one of the crucial aspects for Pakistan's nuclear power programme. Why do we need it and why have we been singled-out of criticism from among a large number of contries in this regard? The central role of a reprocessing plant can be understood from the following facts.

A power reactor normally burns 1—3 per cent of uranium after which, because of fission products produced in the feel, the reactor loses its ability to sustain chain reaction. The burnt fuel is, therefore, discharged and fresh fuel added. We can reuse this discharged fuel provided we remove the poisonous fission products and clean up the uranium and separate plutonium which is produced in the reactor. A reprocessing plant is used to perform this operation. Its advantages are:—

i) It enable one to recover unburnt uranium which can be reused in new power reactors.

ii) It yields plutonium which is known appropriate fuel for breeder recators.

Without plutonium there can be no efficient breeder reactor and without breeders the full potential of nuclear power cannot be realised.

The critics of our reprocessing plant want us to depend upon them for the critical supplies of the reactor fuel. This, however, is not acceptable to us. We have had a bitter experience with Karachi Nuclear Power Plant when Canada unilaterally withdrew from its contractual obligation and stopped supplying fuel for the plant. A Power reactor is almost a billion dollar project and cannot be left at the mercy of others, who may stop fuel supplies any time without any notice and thereby jeopardize a country's entire economic development programme.

It is because of this crucial role of the reprocessing plant that Pakistan is determined to go ahead with this project. As the President of Pakistan stated recently, Pakistan is proceeding with its peaceful nuclear power programme and we will be able to complete our reprocessing, plant even without outside assistance.

AGRICULTURE & MEDICINE

Apart from nuclear power, the Pakistan Atomic Energy Commission is also making use of nuclear radiations in the fields of agriculture and medicine.

Agriculture in Pakistan suffers mainly from low yield and destruction by pests and insects. Our agricultural produce per acre is one of the lowest in the world. Not only that, quite a significant portion of our produce is destroyed by pests and insects both before and after the harvesting. The use of nuclear radiations and radioisotope have played a tremendous role in agriculture by evolving improved varieties of crops and also in medicine by applying latest techniques for the diagnosis and treatment of unconventional diseases.

The Pakistan Atomic Energy Commission has already set up two nuclear agriculture centres, one at Faisalabad and the other at Tandojam, to carry out research programme aimed at evolving new high yielding and disease resistant varieties of crops such as wheat, rice, cotton and pulses. Research is also being carried out on economical storage of foodgrains by disinfestation through nuclear irradiation, efficient utilization of water and fertilizer, and control of insects through irradiation. Both these centres have made significant contribution towards finding solutions to some of the major problems in agriculture by using nuclear radiations and radioisotope techniques. Significant results have been achieved at these centres.

The nuclear agricultural centre at Faisalabad has evolved a new high yielding variety of rice called Kashmir Basmati which matures three weeks earlier than the parent variety. Since it matures earlier, it escapes the onset of winter and can be grown in hilly areas. It has already been sown in Azad Kashmir where it coul not be grown before. This new variety has also opened up the prospect of having one additional crop in the same field which is vacated by the early maturing rice. A new variety of triticale (a cross of wheat and Rye) has also been developed which is high yielding and can be grown in barani areas. Similarly the AERC Tandojam has developed a rust-resistant variety of wheat and a blight resistant variety of potato. These varieties will soon be released for general cultivation.

A third agriculture centre called Nuclear Institute for Food and Agriculture (NIFA) is nearing completion at Tarnab, Peshawar. It will concentrate on preservation of food and fruit which are grown abundantly in the Frontier Province.

Nuclear radiations have tremendous potential in the diagrosis and treatment of various unconventional diseases including cancer. Realizing this significance of atomic energy in public health, the Commission has set up five nuclear centres at Karachi, Lahore, Multan, Jamshoro and Peshawar. Thousands of patients suffering from various diseases are diagnosed and treated at these centres every year. A sixth centre has recently been completed at Larkana and will soon be functional.

The Government has also approved the setting up of the country's largest nuclear medical centre at Islamabad. This centre will be equipped with the most modern and latest facilities including a linear accelerator which is used for the diagnosis and treatment of both superficial and deep seated tumours. The Centre will have facilities for indoor treatment of 75 patients and will be completed in about three years time.

ROLE OF ENGINEERS

Now I turn briefly to the role of engineers in the development of nuclear power in Pakistan. Unfortunately, the impression in the world is that access to nuclear technology is synonymous with nuclear weapons and a developing country seeking nuclear technology is after proliferation. This however, is not so and the misconception in this regard must be corrected. Development of nuclear power has nothing or very little to do with nuclear weapons.

In the early 1940s the role of nuclear physicists was to discover and understand the phenomenon of fission. After the basic scientific knowledge had been attained, the role of technologists and engineers in the nuclear field became more predominant. In fact, it were the engineers who translated the discovery of fission into practical nuclear power. Nuclear technology is truly inter-disciplinary because it covers a large spectrum of disciplines such as physics, chemistry, electronics, electrical, mechanical, chemical, mining civil and even geology and seismology. It requires mastery over diverse specializations in apparently such remotely connected fields as underground water technology so as to understand how nuclear waste products can migrate and meteorology to see how these fission products will disperse. All major branches of engineering have a very important role in nuclear power. In fact, if there is any one sector where we have a meeting ground of all disciplines and which offers a tremendous opportunity for collaboration it is the field of nuclear technology. I, therefore, request the Pakistan Engineering Congress not to abandon the field of nuclear power to physicists alone but to prepare its members to play a leading part in bringing nuclear power to Pakistan. The nuclear power offers tremendous opportunities and challenge to the engineers of Pakistan.

TECHNICAL MANPOWER

We have the problem of quantity of our technical manpower. Our engineering base is very limited. A great contribution of this Congress would be to help reform the educational system of engineering institutions in Pakistan so that we can produce a much larger number of high quality graduates. I believe they can do this because members of this Congress are all in responsible positions.

Nuclear energy also requires a great deal of self-discipline and control to be handled very carefully from purely safety, maintenance and engineering points of view, not to speak of political and emotional handling. We must have a certain measure of self-restraint and control in order to master nuclear technology.

Looking into the next decade there is bound to be yet another revolution in technology. The next decade will be the decade of lasers, computers, electronics and other sophisticated devices which will help do things in a fraction of time as compared to the present. For instance, the basic resource evaluation of a country will be done with the help of satellites scanning in just a few years rather than decades as at present. Lasers will help in nuclear energy both fission and fussion communications industry, defence and in so many other areas. All these subjects need to be introduced in Pakistan.

TRANSFER OF TECHNOLOGY

Pakistan also faces the problem of transfer of advanced technology, and our engineers must wake up to this problem. The Pakistan Engineering Congress should emphasize upon the engineers of Pakistan to stop dreaming that they will be offered technology through the benevolence of advanced countries without any struggle on their own part. We must recognise the political price attached to such gifts and pause and reflect whether we can pay this price. We engineers must, therefore, shed our illusions and resolve to be on our own feet and start a vigorous programme for acquiring and developing technology in Pakistan by building up necessary institutions, edu-

BRIEFS

CEMA NUCLEAR MEETING IN MOSCOW--The prospects for cooperation between the countries belonging to Interatomenergo were discussed at a session of that international economic association's General Council held in Moscow. Taking part in the Council's work were representatives of CEMA organs and other international organizations from the socialist countries. Decisions were adopted aimed at further developing specialization and cooperation in the construction and running of nuclear power stations. The session was addressed by Academician A. P. Aleksandrov, president of the USSR Academy of Sciences. [Text] [LD210907 Moscow PRAVDA in Russian 18 Dec 79 p 4 LD]

CSO: 5100

HUNGARY

KADAR MEETS WITH LOCAL OFFICIALS ON PAKS NUCLEAR PLANT

LD192130 Budapest MTI in English 1700 GMT 19 Dec 79 LD

[Text] Budapest, December 19, (MTI)--Janos Kadar, first secretary of the Central Committee of the Hungarian Socialist Workers' Party, visited the construction of the atomic power plant in Paks (South-West Hungary), on Wednesday. He was accompanied by Ferenc Havasi, secretary of the Central Committee. The guests were greeted at the entrance of the central building of the Paks Atomic Power Plant Company by Kalman Abraham, minister of building and urban development, Pal Simon, heavy industry minister, Jozsef K. Papp, first secretary of the party committee of the county Tolna.

In the council room of the office building Benjamin Szaboka, the government commissioner of the atomic power plant investment, and Gyorgy Hegedus, secretary of the party committee, informed the guests on the situation of the atomic plant's building, on the political work carried on in the circle of the workers. They said, among others, that nearly 10,000 people are working on the construction. However, next year, when the putting into operation of the first machine unit will provide the most work, the number of those participating in the construction and assembling will reach 12,000.

At present there are 292 socialist brigades on the area of the investment. They also spoke of the fact that the first atomic power plant of Hungary is a good example of CMEA cooperation. Soviet plans and installations make possible the building and putting into operation of the plant. At the same time a number of spare parts and part-units are made in Czechoslovakia. The Hungarian specialists working there receive valuable help even on location from Soviet specialists, as well as from the specifically trained Polish ironwork [words indistinct].

The visit--according to the program--will continue with the viewing of the construction, which is unique in the history of Hungarian investments. Janos Kadar will meet with the representatives--leaders of the socialist brigades, workers in the vanguard, leaders of production as well as political and social activists--of the workers of the investment in the afternoon.

CSO: 5100

CASTRO MADERO CITES CNEA 1979 ACCOMPLISHMENTS

Buenos Aires LA PRENSA in Spanish 7 Jan 80 p 6

[Text] The chairman of the National Atomic Energy Commission (CNEA), Vice Adm Carlos Castro Madero, made an analysis of what was accomplished by the agency during 1979, with respect to the preestablished goals, during a press conference held at the Ezeiza Atomic Center. The newsmen were also invited to tour the facilities in which the fuel element factories and the one for casings for those materials will be operating.

The CNEA head began by citing the annual report, but he first emphasized the fact that the plants under construction "will enable us to take a considerable step forward on the path to self-sufficiency in the nuclear field."

He said that, during the year, the national government had issued two decrees "which were extremely important to the nation's nuclear activities." There was No 302, of 29 January 1979, whereby approval was given for the construction, opening and operation of four nuclear powerplants with a power of 600 megawatts, using natural uranium moderated with heavy water, and their supplementary installations, including the facilities related to the fuel cycle and to heavy water production.

Subsequently, through Decree No 2,441, of 28 September, the CNEA was authorized to accept the bid offered by the Sulzer Brothers Ltd company, for a heavy water plant producing 250 tons per year; and that of the Kraftwerk Union Aktiengesellschaft [Power Station Union, Inc], for the establishment of an engineering corporation to build the Atucha II powerplant.

The pertinent contracts are being studied by the CNEA, and will be sent to the president of the nation for his consideration during the early months of 1980.

Nuclear Powerplants

In discussing each of the entity's programs, Vice Admiral Castro Madero remarked that, in the one associated with the plan to build and operate nuclear powerplants with increased native participation, stress should be placed on "the efficient operation of the Atucha nuclear powerplant, programed to produce 2.45 million net megawatts during the year, which, despite its widely publicized shutdown, as of 31 December had generated net power amounting to 2,505,500 megawatts, representing 2.26 percent more than planned."

He added: "By so doing, it contributed more than 8 percent of the total power generated by the public electrical service; and, at the same time, it attained a load factor of about 89.6 percent with respect to the original power called for in the design, something that will continue to rate it among the best powerplants in the world."

He also announced that 55 percent of the civil construction on the second tank house for storing fuel elements at Atucha had been completed.

With regard to the Embalse powerplant, in Cordoba, he reported that 90 percent of the civil construction had been completed, and 20 percent of the reactor's electromechanical elements had been installed, as had 32 percent of those related to the service building, 25 percent of the assembly for the turbogenerator and 18 percent of the electrical assembly for the conventional part had been completed, and 80 percent of the circulating and processing pipework had been installed.

As for the assembly work provided by the CNEA, 65 percent of the total was completed in installing the powerplant's 32 underground systems, as was 54 percent of the reactivity mechanisms and 100 percent of the fuel channels. In addition, 60 percent of the operating personnel was provided for, and the training of its members on the job is continuing.

As for the project that is under way in Peru, the basic civil engineering work is virtually finished, and the detail engineering is well under way.

The administrative and accounting sector has been organized, as has the technical office and that for documentation; and, in cooperation with the INTI [National Institute of Industrial Technology], the quality guarantee department has been set up. The advice on the operation and maintenance of the RPO training reactor built by the CNEA and in service since 20 July 1978 at the Peruvian Nuclear Energy Institute was continued; and the plan for the training and qualification of personnel from that country is still in progress.

Supplies to Powerplants

The plan for supplies to nuclear powerplants, the purpose of which is to provide them with the maximum native share of science, technology and industries, has concentrated its activity on completing the fuel cycle and heavy water production.

With the prospecting of 100,000 square kilometers in Patagonia, and exploration in Sierra Pichinan, Chubut; Sierra Pintada, Mendoza; Sierras Pampeanas, Cordoba; and the Tonco-Amblayo district, Salta, there was an increase in reserves amounting to 1,250 tons of uranium in the category of reasonably assured economic resources, which represents 4.6 percent, and an estimated 900 tons in the category of additional economic resources, representing 6 percent more than during the previous year.

Insofar as ore treatment is concerned, the production of uranium concentrates increased 2.5 times at the Malargue plant, with an average of 75 tons of uranium per year; and a plant was built in San Rafael with a production capacity of 60 tons per year.

The combined production from those plants, plus that attained at the Don Otto and Los Adobes plants, totals 160 tons of concentrate production, representing a 23.7 percent increase over 1978.

Moreover, the exploitation of the "Tigre III" deposit in Sierra Pintada began, to supply the Malargue and San Rafael plants; the "Los Gigantes" deposit, in Cordoba, was awarded to an Argentine private company which will produce 100 tons per year starting at the end of 1980; and bids have been called for the exploitation and production of concentrates at the Sierra Pintada deposit, which will go into operation during the second half of 1982, with a production of 700 tons per year.

The uranium dioxide plant was put into operation on an experimental basis, to revise the reduction process and to attain the quality required by the plant for fuel elements. Twelve demonstration fuel elements were manufactured, and three of them performed their nuclear service with satisfactory results. The rest are still being irradiated at the Atucha powerplant.

The pilot plant at Constituyentes is manufacturing structural parts for the production of 200 fuel elements needed to "begin operations at the factory," which is under construction in Ezeiza, and on which 90 percent of the civil construction has been completed and is expected to be finished by next January. The optimization of fuel elements at Atucha has begun, and will bring about a 3 percent savings in their manufacture.

The graphitizing and strength welding processes for the manufacture of Candu type fuel elements have been perfected, and three different manufacturing lines of low enrichment fuel elements for research reactors are being developed.

For the production of casings for fuel elements, 80 percent of the civil construction has been completed, and 70 percent of the detail engineering and equipment for the chemical treatment sector have been provided. Also, the assembly and activation of the main pipe rolling mill and its auxiliary equipment have been completed; and assembly has started on the plant for compacting and casting sectors. In addition, the laboratories for quality control, and grading and evaluation of materials both in process and finished are in operation.

Work is continuing on the production of zirconium sponge and, on 2 February 1979, the contract was signed for the construction of an experimental plant, and the site on which it will be located was prepared. Civil construction work and detail engineering were carried out; and the plans call for the completion of the project in the latter part of 1981.

At Ezeiza, assembly was finished on the hydrosulfuric acid experimental loop, which went into operation; and experimental work began with air and nitrogen.

Radioisotopes and Radiation

In the area of radioisotope production and radiation sources with applications in science, technology, industry and medicine, the supply of material and the permanent radiosterilization service continued. The manufacture of radioactive material exceeded that attained in 1978 by 10.3 percent.

Two intermediate activity and two double specific high activity cells for the production of radioisotopes by fission were added to the existing facilities.

By virtue of a special arrangement, collaboration is under way with the Secretariat of Public Health of the Nation, with national universities and with authorities in Salta, Corrientes, Chaco, Jujuy, Tucuman, Entre Rios, La Rioja, La Pampa, Neuquen, Rio Negro, Chubut, Buenos Aires and Santa Fe, on work ranging from mere advice to the planning and execution of a draft plan for the construction of a Regional Center for Biomedical Applications, which would be built in Chaco.

Through an agreement with the Secretariat of Public Health, laws and regulations will be passed to govern operational activities related to nuclear medicine and X-ray therapy services.

Security

As part of the program for radiological protection and nuclear security, the goal of which is to insure the country protection for its population and for the environment against the effects of radiation, the radio-sanitation activities and those for inspecting all the nuclear activities being carried out in the nation as a whole are continuing.

The activity associated with standards and the formulation of criteria for radiological protection and nuclear security is also being continued; and a regulatory frame of reference has been established to which the bids on the design and construction of the Atucha II powerplant had to adhere.

There was participation in the making of international recommendations and codes for protection and security, as well as on the handling of the radioactive waste being generated at present; and several study plans were initiated on problems which that waste will pose in the future.

Among other tasks, radiological protection studies were made prior to the opening of plants; control was exercised over supplies and movement of special fissionable material, in accordance with the country's commitment regarding safeguards; and work was done on the authorization, registration and control of users of radioactive material and ionizing radiation.

Research and Development

The research and development program calls for the establishment of a scientific and technical structure with its own capacity for accomplishment, to produce the information required to achieve self-sufficiency in the nuclear area. In that respect, the overall plans were maintained in the fields of physics, chemistry and radiology, which will provide much important and original scientific data related to nuclear science. An adjudication was made of the civil construction on the heavy ion accelerator and the support laboratories; and the contract was signed for the supply, installation and final testing of the pressure receiver. Equipment for research on nuclear fusion was designed and is under construction; and tests were made on a fixed solar energy concentrator prototype designed by the CNEA to reach temperatures suited for activating wager pumping systems, to produce steam for industrial uses and to drive turbogenerator sets.

This year, it is expected to breed the first animals free from pathogenic germs on an experimental scale. Work was done to back up the projects for the manufacture of fuel elements, zirconium sponge and heavy water, and for the production of uranium dioxide; and 47 percent of the civil construction on the reactor with nuclear engineering in San Carlos de Bariloche was completed.

In addition, arrangements were made for documentation on the basic engineering for the construction of a plant for production of uranium concentrates, which will serve as a basis for comparison in evaluating bids on the exploitation of the Sierra Pintada deposit. Significant progress was made in techniques for chemical and isotopic analyses for quality control of fuels and nuclear materials.

Management and Training

In this area of activity, courses continued to be given in the fields leading to the degree in physics and nuclear engineering, at the Balseiro Institute of Physics, which 30 additional students entered last August.

At the training center near Atucha, the fifth course was given on nuclear powerplants for the training of technicians; as well as the sixth course on information in basic areas of nuclear-electrical development, for Argentine and Latin American professionals.

Four courses were also given in methodology and application of radioisotopes, in addition to one on dosimetry in X-ray therapy, and another in radioimmunoanalysis. Training was continued for nuclear physicists in the use of the heavy ion electrostatic accelerator; and the 60 percent who are already trained are abroad taking courses for improvement and specialization.

Courses were also held on reactors, thermodynamics, metallurgy, radiological protection and security, and thermonuclear plasma physics. Under the sponsorship of the IAEA, an international symposium was held on techniques for evaluating uranium ore, as well as a regional seminar on quality in the technology of nuclear fuel, and a regional conference on non-destructive tests.

Under the sponsorship of the Inter-American Nuclear Energy Commission (IANEC), the Directorate of Nuclear Supplies gave the Latin American course on evaluation of traces of uranium deposits, in which 10 grant-holders participated over a period of 4 months.

There were work sessions on direct utilization of solar energy, in connection with the agreement between CONICET [National Scientific and Technical Research Council] and the National Science Foundation of the United States.

In the area of backup infrastructure, projects of various types were carried out at the Bariloche Atomic Center, and in Constituyentes and Ezeiza.

With regard to plans for cooperation, two will be arranged with Chile, in metallurgy and nuclear-electric planning; the agreement with Ecuador was ratified; a plan of action for the 2-year interval 1980-81 with Romania is being studied; the cooperation with Peru is being continued; and an agreement was signed with Venezuela.

The administration is being updated with the aid of the Computer Center at the Constituyentes Atomic Center.

Finally, Vice Admiral Castro Madero declared: "In 1979, the National Atomic Energy Commission responded to the effort made by the nation to support it, and to the important role incumbent on it in Argentine scientific and technical development during the times in which we are living;" and he expressed appreciation for "the major backing" that the press always gives to the CNEA.

Tour

At the conclusion of the address by the head of the entity, and after he answered questions asked by the newsmen in attendance, he made a tour of the facilities in which the factories for fuel elements will operate, observing the zircaloy casings (made of an alloy of zirconium and other metals which do not attract neutrons) that contain them.

The plants, the total cost of which has been estimated at about $20 million, have been installed in buildings that are perfectly suited for the special manufacturing methods needed for elements with nuclear uses. For example, they have expensive, modern air conditioning equipment, because the fuel must be manufactured without the slightest trace of dampness.

The civil construction has been completed, and work is being done on the assembly of equipment and machinery of various types; while, at the Constituyentes Center, the technological lines are being improved in order to put the Ezeiza plants into operation.

Devised to attain a production of 300 tons, they will manufacture about 70 at first, to supply Atucha.

The facilities have the capacity and have been planned to serve the aforementioned powerplant, the one at Embalse and Atucha II, when they go into operation; and they may be expanded for the others for which construction has been approved.

The water tower in the foreground, and part of the installations of the plants for manufacturing fuel elements and their casings, which are under construction at the Ezeiza Atomic Center.
2909
CSO: 5100

ARGENTINA

CASTRO MADERO REAFFIRMS NATION WILL NOT BECOME NUCLEAR DUMP

Buenos Aires LA NACION in Spanish 2 Jan 80 p 20

[Text] The chairman of the National Atomic Energy Commission (CNEA), Vice Adm Carlos Castro Madero, reiterated that Argentina will not become converted into a "nuclear dump," and claimed that the degree of technological development attained by the agency's specialists would gradually do away with dependence on foreign countries.

Castro Madero held a press conference on the premises of the Ezeiza Atomic Center, on the outskirts of the city. He made an assessment of the work accomplished by the CNEA during 1979.

The processing plant for fuel elements to be used by the Atucha, Atucha II and Embalse Rio Tercero atomic powerplants was shown. The plant will go into service during 1980 and, in its initial phase, it will produce 70 tons of fuel material per year; increasing the volume to 300 tons during the course of the next decade.

The Argentine atomic program calls for the Embalse Rio Tercero Nuclear Power plant, in Cordoba Province, to go into operation in 1982. The Atucha II plant will do so in 1987.

The fuel elements plant to be set up in Ezeiza has been planned to supply the energy feed from the nuclear reactors to those three powerplants; but it is also programed to expand production during the 1990's with other nuclear powerplants that have been planned.

He pointed out that the degree of technological development acquired by the Argentine specialists has now made it unnecessary to seek such assistance, while releasing Argentina from being bound to treaties and commitments which could potentially limit its nuclear development and expansion.

However, he explained that the decision to give up that assistance did not mean Argentina's dissociation from the international organization; and that, on the contrary, the CNEA had made the pertinent contributions of resources so that such aid could be offered to nations less developed in the atomic field.

Castro Madero was also asked about the renegotiation of an agreement with the United States for supplies of enriched uranium, which has been hampered by that country's imposition of restrictive clauses rejected by Argentina.

He explained that enriched uranium is used in Argentina only to fuel small reactors in research centers.

He remarked: "Our entire system for the expansion of our energy potential is based on natural uranium and heavy water reactors." Therefore, he expressed the view that, in the event that an agreement is not reached with the United States, some obstacles might occur in the research area, but not in that of the power generating plants.

He noted that, in any event, there are other supplying centers, including the USSR and European countries to which we might possibly resort to obtain supplies.

In response to another question, he reiterated that Argentina would not become a center for the reception of nuclear waste; and stated that this issue would not arise in the country, precisely because the Argentine atomic powerplants are programed to use natural uranium, which eliminates the consequences of radioactive waste.

2909
CSO: 5100

ARGENTINA

BRIEFS

NUCLEAR ACCELERATOR--Carlos Castro Madero, president of the National Atomic Energy Commission, CNEA, attended a ceremony inaugurating the project for the construction of the Tandar nuclear accelerator. [Buenos Aires CLARIN in Spanish 31 December 79 p 8 PY]

CSO: 5100

TEXT OF NUCLEAR ACCORD WITH IRAQ OUTLINED

Rio de Janeiro JORNAL DO BRASIL in Portuguese 8 Jan 80 p 17

[Text] Saturday, in a ceremony only announced yesterday by Itamarati, Brazil and Iraq signed a cooperation agreement in the nuclear area, which stipulates the transfer to Baghdad of technology on the exploration and treatment of uranium, equipment, construction of reactors, installation safety, and personnel training, but establishes as conditions those restrictions contained in the 1975 agreements with respect to the passing on of any material or knowhow obtained from Germany.

That agreement with Iraq, whose planning was initiated back during the visit by Iraqi Vice President Taha Ma'ruf to Brasilia in May last year, did not even require the presence of the president of NUCLEBRAS [Brazilian Nuclear Corporations] in Baghdad: it was signed by Ambassador Paulo Nogueira Batista in Rio at the same time that it received the signature of Iraqi Atomic Energy Commission President Dr A.K. Al-Hashimi in the capital of Iraq on the same Saturday.

The text, which had been negotiated back last December, was initialed by the contracting parties before being submitted for the signature of the two governments. It stipulates the following:

1. Bilateral cooperation will be effected in keeping with the priorities of each party "in complete conformity with the international commitments and obligations of each of them" (which means restrictions on the passing on of technology received by Brazil from the FRG, and compliance with safeguards of the trilateral Brazil/FRG/IAEA agreement).

2. The two parties emphasize their support for the principle of non-proliferation of nuclear weapons and they reaffirm their right to develop and use nuclear energy for peaceful purposes.

3. Cooperation will cover the following areas:

- Survey of resources and prospecting and exploration of uranium.
- Supply of natural uranium and uranium with a low degree of enrichment, possibly in the form of fuel elements for use in nuclear reactors.
- Reactor safety.
- Exchange of experience on the use of the IAEA "international system of nuclear information."
- Exchange of visits to research institutions and development and execution of scientific experiments.
- Personnel training.

Pledge

The governments pledge to inform the IAEA, which has its headquarters in Vienna, on negotiations for the agreement so that safeguards may be applied pursuant to the obligations assumed by each party with that international agency. Iraq, unlike Brazil, is a signatory of the Nuclear Weapons Nonproliferation Treaty.

Safety clauses are applied to the materials subject to safeguards which may be exported from one party to the other, and to the retransfer by one party to a third country of any material or equipment provided to it by the other party (it being mandatory that the third country first conclude a safeguard agreement with the IAEA of the same type which applies to the material or equipment in question in the exporting country).

The holding of annual meetings for monitoring the progress of the agreement, the solution of possible controversies by diplomatic means, period of validity for 10 years, which may be extended for successive periods of 1 year, and the possibility of termination for cause within a period of 6 months, are also stipulated.

The nuclear agreement may go into effect only after compliance with constitutional requirements in each of the countries. In Brazil that is a matter for the National Congress.

When revealing the signing of the agreement with Iraq Itamarati made it clear that "the cooperation stipulated does not include any possibility of providing sensitive material or technology such as the transfer of installations or knowhow for uranium enrichment or reprocessing nor for supplying uranium with a high degree of enrichment."

8908
CSO: 5100

FUND SHORTAGES LIMIT NUCLEBRAS 1979 URANIUM PROSPECTING

Rio de Janeiro JORNAL DO BRASIL in Portuguese 28 Dec 79 p 19

[Text] Lack of resources led NUCLEBRAS [Brazilian Nuclear Corporations] to concentrate its efforts this year on measuring uranium deposits already known, particularly those of Itataia in Ceara and Lagoa Real in Bahia, to the detriment of the opening of new prospecting areas, according to NUCLEBRAS Director of Mineral Resources John Forman.

As a result, the volume of measured and indicated reserves, which means those estimated with a reasonable degree of accuracy, increased from 87,500 tons in April to 126,000 tons in December. However, the total amount (which included potential reserves, that is, reserves established with a lesser degree of accuracy) rose from 193,800 tons in April to only 215,300 tons in December. At any rate, Brazil climbed from sixth to fifth place in the rank of countries which have the largest uranium reserves (the others, in order, are: the United States, South Africa, Australia and Canada).

The Germans Did Not Help

The German partners of NUCLEBRAS, who are also prospecting for uranium in Brazil through NUCLAM [NUCLEBRAS Mining Assistance, Inc.], contributed nothing to the increase of Brazilian reserves in the 1978/1979 period. Although NUCLEBRAS increased the known reserves from 142,300 tons in December of 1978 to the present 215,300 tons in the prospecting work it is performing by itself, NUCLAM maintained its share in the total--10,000 tons--unchanged (discovered in 1978 after 2 years of work initiated in 1976). NUCLEBRAS, which began to search for uranium in 1975, has already increased the uranium reserves known up to that time--11,000 tons--by 1850 percent, according to John Forman.

NUCLEBRAS spent 360 million cruzeiros in uranium exploration and prospecting (of an overall budget of 10 billion cruzeiros, of which 6 million were investments). That investment remained below the rate of inflation for the year: 337,856,000 cruzeiros were spent in 1978. Thus, the nominal increase was 6.5 percent over the expenditures of last year and 70 percent below inflation.

NUCLAM, proportionately, has already spent more, although it did not record any real increase in investments. Compared to an investment of 72,567,000 cruzeiros in 1978, it spent 90 million this year, 24 percent more in nominal terms but 52 percent below inflation. John Forman believes that it will not be possible to open many new areas to uranium prospecting next year either, because the policy of concentrating resources in measuring already known deposits must be maintained.

Exports

John Forman revealed that the size of the production capacity of the nuclear fuel cycle plants is going to depend on the number of nuclear power plants to be built. He said, however, that there are possibilities of exporting uranium, "something which depends on a government decision." Present Brazilian reserves are worth $15,071,000,000 at current international market prices if they are exported in the form of uranium concentrate (yellow cake), which is priced at $100 a kilogram. According to John Forman, the cost of extracting and producing Brazilian uranium concentrate "is less than $88 per kilogram."

8908
CSO: 5100

STATUS OF URANIUM ENRICHMENT PILOT PLANT, OTHERS DISCUSSED

Rio de Janeiro O GLOBO in Portuguese 8 Jan 80 p 20

[Text] At the end of 1979, Brazil received the first uranium enrichment pilot plant which is part of the nuclear fuel cycle. That unit, which was developed by the KWU (the German company providing technology) is being installed at the Belo Horizonte Nuclear Technology Development Center and will go into operation in the first quarter of this year.

This information was provided by a source of the sector, who stated that this is the first specific step in terms of the assimilation of fuel cycle technology within the framework of the Brazil-German Nuclear Agreement. The fuel cycle also involves the conversion of uranium concentrate into hexafluoride for enrichment; the conversion of hexafluoride into fuel elements and the reprocessing of spent uranium.

Tests

The pilot plant was built in West Germany, where it was tested. Based on that configuration, the plan for the Resende industrial unit, which is going to engage in enrichment on a commercial scale as of 1985, was approved. The pilot plant will now be used by Brazilian technicians in the performance of independent research.

The enrichment process Germany sold Brazil is still very much debated as to its technological efficiency. It is a jet centrifuge system. The process desired was that of the ultracentrifuge developed by a consortium of European countries called URENCO, which consists of England, Germany and Holland. However, Germany's partners are radically opposed to the sale of nuclear technology to underdeveloped countries.

The technicians performing research on the jet centrifuge system have not yet found a way capable of reducing the high costs of the service. One of the characteristics of that process is the high consumption of electricity.

The third enrichment method known today is that of gaseous diffusion, controlled by the United States, which is also opposed to the transfer of technology to underdeveloped countries.

Resende Plants

Three units, which are part of the fuel cycle: conversion, enrichment and manufacture of fuel elements, are being built in Resende.

The purpose of the conversion plant is that of converting uranium concentrate into hexafluoride, the concentrate being produced by the concentrating plants near the mines. The capacity of those units will be a production of 500 tons of concentrated uranium per year. Technology for it will be sold by France.

The enrichment unit will have a first part completed around the middle of 1982, and it will be a prototype which would not yet allow production on a commercial scale. NUCLEBRAS [Brazilian Nuclear Corporations] intends to complete the main unit in 1985.

Finally, the fuel element (pellets) manufacturing unit should be operating on a commercial scale by 1985 and NUCLEBRAS expects that the first reloading of Angra I will already be accomplished with pellets produced at Resende.

The projections of the timetable are those of NUCLEBRAS, which expects to continue the Nuclear Program without any change in pace, although some sources of the sector consider it practically impossible that there will be no delays in time periods because of the lack of resources.

8908
CSO: 5100

FURNAS RENEGOTIATES LOANS FOR ANGRA POWERPLANT CONSTRUCTION

Rio de Janeiro O GLOBO in Portuguese 29 Dec 79 p 19

[Text] The FURNAS Electric Powerplant company, a subsidiary of ELETROBRAS [Brazilian Electric Power Companies, Inc], officially announced yesterday that it has just finished renegotiating the debt consisting of the two foreign loans for the construction of Angra II and Angra III.

The renegotiation was done with the consortium of European banks which made the loans through the Compagnie Luxemburgueuse of the Dresdner Bank, which acted as agent. Through the agreement, FURNAS obtained a reduction of 1.93 percent of the interest and an extension of 6 years for the payments of amortization and charges for the loans, which normally would come due next January: one for $58 million and another for 239 million marks, a total of 8.5 billion cruzeiros.

The FURNAS press office also reported that renegotiation of debt could become a general policy within the company, including with the loans destined for the construction of the direct current line from Itaipu to be made by the ASEA (Swedish)-PROMON [expansion unknown] consortium. FURNAS spokesmen do not acknowledge officially that renegotiation of the debt for the nuclear powerplants is linked to the delay in their construction, however, ELETROBRAS sources confirmed this story. Thus, the equipment covered by these loans will probably not be supplied within the periods stipulated.

According to the FURNAS communique, the document which changes the structure of the foreign debt of the company was signed yesterday in Luxembourg. Talks on renegotiation of the debt were begun last August, "taking advantage of the favorable conditions of the foreign capital market."

The original period for the payment of the debt was 8 years, beginning in 1976 and ending in 1984. The actual amounts of the contracts, which come due next 23 January are 265 million marks (6.6 billion cruzeiros) and $65 million (nearly 2.8 billion cruzeiros). The communique also says that "The majority of the 17 banks which make up part of the consortium agreed to the renegotiation." Therefore, FURNAS will only begin to repay that debt in 1986.

8908
CSO: 5100

BRIEFS

URANIUM PRODUCTION--Tel Aviv Dec 21: Israel will next year start producing uranium for power plants, Elishou Teoumin, Managing Director of the Negev Phosphates Company Chemicals, Israel said today. It has reserves of 40,000 tons enough to supply eight to 10 one-megawatt nuclear reactors for several dozen years, he said. The 0.1 to 0.2 percent uranium content in the Dead Sea and Negev phosphate deposits is insufficient to justify direct extraction. But extraction is commercially worthwhile as part of fertilizer, acid and phosphate derivate extraction he said.--AFP [Text] [Karachi MORNING NEWS in English 22 Dec 79 p 8]

CSO: 4820

ACADEMY OF SCIENCES PRESIDENT, OFFICIALS ON NUCLEAR ENERGY

LD182234 Moscow TASS in English 2136 GMT 18 Dec 79 LD

["Atomic Power Engineering in the USSR and Its Prospects"--TASS headline]

[Text] Moscow, December 18, TASS--The Soviet Union will continue developing atomic power engineering. This was said by Academician Anatoliy Aleksandrov, president of the USSR Academy of Sciences, at a press conference here. This is to be done, he said, by building new power stations and increasing the capacity of the existing ones.

The scientist recalled that the Soviet Union was the first to design and build an atomic power station, thus ushering in the epoch of peaceful utilisation of atomic energy.

"At present a number of atomic power stations have been built and successfully operate in the Soviet Union. They are the Novovoronezh, Kola, Armenian, Leningrad, Kursk and Chernobylskaya atomic power stations. The Smolensk, Kalinin, South-Ukrainian and other power stations with a capacity of up to 1,500 megawatts are under construction."

Special attention in this country, Aleskandrov stressed, is being given to the safety of atomic power stations and environmental protection. "We have had no dangerous cases of radiation at our atomic power stations," he said. The servicing personnel at the Soviet atomic power stations receives 5 roentgen a year, that is as much as a patient when he is x-rayed during a medical examination, Aleksandrov said.

Andronik Petrosyants, chairman of the State Committee for the Utilization of Atomic Energy, reported that in the Soviet Union atomic power engineering is developing in two directions: Both slow-neutron and fast-neutron atomic power stations are built and operate. In his opinion the attempts to limit the development of atomic power engineering are unjustifiable since unreplenishable sources of energy are being exhausted.

When asked by pressmen where atomic power stations will be built the scientists said that they will be built in areas which have little or no natural fuel. "Such stations [will] be built near big cities because even potentially they do not pose any danger to the population," said Academician Mikhail Styrikovich.

Turning to the problem of disposal of waste products of atomic power stations, Academician Aleksandrov said that the most dependable methods of storing them are bitumisation, cementation, and vitrification of radioactive waste products. Aleksandrov considers the latter method especially promising. In this form they may be carried in special containers, without any risk to the population, to places of burial where they cannot be reached by subsoil waters. In the opinion of Soviet specialists salt domes are very convenient storages for radioactive waste.

Speaking at the press conference Academician Yevgeniy Veliskov recalled that Soviet scientists and engineers are confidently moving ahead toward mastering thermonuclear energy.

CSO: 5100

'FUSS' OVER NUCLEAR POWER STATION SAFETY DISMISSED

LD171925 Moscow Radio in Spanish to Spain 2000 GMT 16 Dec 79 LD

[Excerpts] Radio Moscow commentator Viktor Starostin explains how energy problems are resolved in the USSR:

The extraction of combustible fuels requires ever greater efforts and expenditures. This is happening all over the world. However, energy requirements are doubling every 15-20 years. At the moment close to 70 percent of the world's energy consumption comes from oil and natural gas, but their reserves in the ground are limited.

In the past 15 years in the USSR we have almost doubled the generation of electricity and oil production including gas condensate, and we have quadrupled the production of natural gas. The USSR extracts more oil than any other state and also has a powerful coal industry. The increase in coal production is allowing us to reduce the amount of liquid fuel for power stations. In our country, 42 percent of our thermal power stations are fueled with coal. In the United States this figure is only 18 percent. The U.S. oil monopolies, in search of greater profits, have been practically strangling other branches of fuel production. In the USSR, where private firms do not exist, there are no individuals therefore speculating with the needs of society. Also, because of this, all branches of energy in our country are developing rapidly even though this requires enormous resources. A third of investments in industry is allocated to energy.

Soviet specialists have been searching for a long time for alternative sources of energy, access to which will be opened up with the success of the scientific-technological revolution. The use of nuclear energy marked a milestone in this respect. Our objective is nuclear energy for peaceful purposes. These words by the well known Soviet physicist, Igor Kurchatov, reflect the essence of the Soviet policy. In these times, mankind can no longer satisfy its increasing demand for energy without harnessing nuclear energy for peaceful purposes. Our country was the first to take this road a quarter of a century ago. A hundred kilometres from Moscow the first nuclear power station in the world was built. At the moment in the USSR, the important task of utilizing nuclear fuel more rationally is successfully being solved.

New types of reactors have been developed which considerably increase the production of electricity per kilo of uranium. Even if all the power stations went over to nuclear fuel the cost of traditional fuels would only be reduced by 20 percent. Therefore, in the USSR, we are working to use nuclear energy in the heating system of cities and the technological processes of industrial enterprises. We are planning to build reactors for heating cities which will be able to be installed in residential districts thanks to the high safety level. In the USSR we are already starting to build nuclear power stations for heating purposes.

Lately in the West, there has been a lot of fuss about the nuclear power stations which are under construction. It is said that they are dangerous for the population. This campaign conceals the interests of the fuel monopolies, above all, the oil companies. Nuclear power stations threaten their interests and of course nuclear energy does have some unfavourable aspects--it is necessary, for example, to keep atomic waste safely for a long time to avoid atmospheric pollution. This can be solved independently of the level of energy development. In the USSR half of the cost of constructing nuclear power stations is invested in guaranteeing complete safety.

The amount of radioactive substances which escape into the atmosphere from nuclear power stations in the USSR is thousands of times below the safety norms which have been established. Special control posts, situated at a determined distance in a radius of 40 kilometres, control the working of the power stations. These posts observe the atmosphere, the earth, the flora and water. Around the nuclear power stations the air is much purer than in the areas around conventional thermal power stations which give off noxious mixtures and consume a large amount of oxygen in combustion. It is a paradox, but according to the research, the danger of radiation from nuclear power stations is 70 times less than from a thermal power station of the same power, although in both cases it is insignificant. The thermo-nuclear synthesis derived from the nuclei of light atoms, including hydrogen, which exist in large quantities will provide mankind with an inexhaustible source of energy.

In the opinion of the Soviet physicist, Anatoliy Aleksandrov, president of the USSR Academy of Sciences, the first thermal-nuclear power stations will be built within 10 years. Limited perspectives are also opened up by the use of solar energy and the tides of the sea. Obtaining them in great proportions is something for the future. For the moment we consume what is in the subsoil and we need to exploit this wealth rationally and at the same time prepare a basis for the accelerated development of energy. Rational and planned utilization of all possible energy sources is allowing the Soviet people today to avoid the energy problems and trust that in the future the USSR will not experience an energy crisis.

CSO: 5100

NUCLEAR ENERGY EXPERTS PRAISE SAFETY MEASURES, LACK OF ACCIDENTS

LD210956 Moscow World Service in English 2100 GMT 20 Dec 79 LD

[Text] Here in Moscow, there has been a news conference devoted to the safe operation of nuclear power stations. Taking part were leading Soviet energy experts. Questions on that subject asked by Soviet and foreign correspondents were answered by the President of the Academy of Sciences Anatoliy Aleksandrov and the Chairman of the State Committee on Nuclear Energy Andronik Petrosyants. Our correspondent attended the news conference and here is what he had to say:

There are about 230 nuclear power stations in the world and this number is expected to grow. It has become evident that without nuclear fuel, mankind will not be able to meet its rapidly growing energy needs that double every 15-20 years. Besides, it's more reasonable to preserve oil and gas that are used most extensively now and to use them mostly as raw materials for the production of plastics, fodder and other chemical products.

One of the main problems facing nuclear power engineering is to avoid harm to the environment and people. Academician Aleksandrov said this problem can be solved. In the Soviet Union, half the funds spent on the building of nuclear power stations goes for insuring complete safety of their operation. Nuclear reactors are provided with duplicated (?off) protective systems that practically exclude any accidents. When the radioactive contamination caused by an accident at the Harrisburg power station was mentioned at the news conference, Andronik Petrosyants said a fault of that kind at a Soviet nuclear power station would have been eliminated right away. The Soviet Union has great experience on how to store safely radioactive waste. It is now possible in principle to make those wastes nonactive. Measurements made in the vicinity of Soviet nuclear power stations revealed that the level of radiation there has not grown.

The Soviet Union was the first country to start using nuclear energy for peaceful purposes and that was 25 years ago. Since then, there have not been any accidents leading to the threat of radioactive contamination at Soviet nuclear power stations.

[Begin Petrosyants recording, fading to English translation] We have no accidents that (?would) give rise to anxiety among people and set them against the development of nuclear power engineering, Andronik Petrosyants told the news conference. [end recording]

CSO: 5100

BRIEFS

PROTOTYPE REACTOR--Leningrad, January 2, TASS--The Soviet installation Pik, now being built at the Nuclear Physics Institute in Gatchina, near Leningrad, will become the first of a new generation of nuclear reactors designated for fundamental physical research and solving a broad range of tasks of applied physics. Kir Konopiev, head of the project, said to a TASS correspondent that the reactor will give an opportunity for researchers to investigate the most intrinsic processes in solid matter, interaction of elementary particles and other problems of nuclear physics and radiation chemistry. He stressed the high reliability of radiation protection systems envisaged by the project. The scientist said that the institute has started making programs of experimental work on the reactor. It is believed that physicists from the CMEA countries and specialists from Switzerland, France, and the United States, who enjoy close scientific relations with the Gatchina Institute, will take part in the experiments. [Text] [LD021100 Moscow TASS in English 1036 GMT 2 Jan 80 LD]

CSO: 5100

BRIEFS

POWER STATION CONSTRUCTION HALTED--The town council of Lemoniz, in Vizcaya, has ordered a complete halt to construction work on the nuclear power station being built by the firm Iberodeuro in Lemoniz. This decision has been presented to Iberoduero to allow it 1 month to lodge an appeal with the courts and has also been communicated to the municipal police to insure that the decision is carried out. On 28 November the council fixed a 15-day time limit for Iberoduero to present a construction permit for the nuclear power station. With the expiration of this time limit, the council has now ordered a complete halt to construction. A few days ago Vizcaya's civil governor agreed to suspend a similar decision reached by the council of Munguia, which is also affected by the Lemoniz nuclear power station. [Text] [LD280426 Madrid Domestic Service in Spanish 1800 GMT 27 Dec 79 LD]

CSO: 5100

END

END OF
FICHE
DATE FILMED

11 FEB '80

MAK